

WE CLAIM:

1 1. A method of constructing a data pattern comprising:
2 calculating an actual value using selected data of the data pattern;
3 determining a desired value of the actual-value calculation using the selected data;
4 determining a correction value to be applied to a portion of the selected data;
5 performing an operation using the correction value and the portion of the selected
6 data, thereby yielding a replacement value; and

7 making the portion of the selected data equal to the replacement value, thereby
8 yielding adjusted selected data.

1 2. The method of claim 1, wherein:
2 the data pattern comprises a data loop;
3 the desired value is stored in a first frame of the data loop; and
4 the actual value is a function of the content of a preceding frame of the data loop.

1 3. The method of claim 2, wherein the data pattern comprises binary data and the
2 step of determining the correction value comprises performing an exclusive-Or operation of
3 the actual value and the desired value.

1 4. The method of claim 3, wherein the step of performing the operation
2 comprises performing an exclusive-Or operation of the correction value and the portion of the
3 selected data.

1 5. The method of claim 4, wherein the data pattern is used for time-domain
2 testing.

1 6. The method of claim 5, wherein the time-domain testing comprises bit-error-
2 rate testing.

1 7. The method of claim 4, wherein the data pattern is used for frequency-domain
2 testing.

1 8. The method of claim 7, wherein the frequency-domain testing comprises
2 spectrum analysis.

1 9. The method of claim 4, wherein the data pattern comprises at least one
2 Synchronous Optical Network (SONET) frame.

1 10. The method of claim 9, wherein the step of calculating comprises performing
2 a Bit Interlace Parity (BIP) calculation.

1 11. The method of claim 10, wherein:
2 the data pattern comprises at least a last frame and a first frame;
3 the desired value is stored in the first frame;
4 the actual value is calculated on the last frame.

1 12. The method of claim 10, wherein the data pattern comprises a plurality of
2 frames and a plurality of the plurality of frames include identical B bytes.

1 13. The method of claim 11, wherein the last frame and the first frame are the
2 same frame.

1 14. The method of claim 10, wherein the desired value comprises at least one of a
2 SONET B2 byte, a SONET B3 byte, and a SONET B1 byte.

1 15. The method of claim 9, wherein the number of frames in the data pattern
2 equals one.

1 16. The method of claim 4, wherein the data pattern comprises at least one
2 Synchronous Digital Hierarchy (SDH) frame.

1 17. The method of claim 16, wherein the step of calculating comprises performing
2 a Bit Interlace Parity (BIP) calculation.

1 18. The method of claim 17, wherein:
2 the data pattern comprises at least a last frame and a first frame;
3 the desired value is stored in the first frame;
4 the actual value is calculated on the last frame.

1 19. The method of claim 17, wherein the data pattern comprises a plurality of
2 frames and a plurality of the plurality of frames include identical B bytes.

1 20. The method of claim 18, wherein the last frame and the first frame are the
2 same frame.

1 21. The method of claim 17, wherein the desired value comprises at least one of a
2 SDH B2 byte, a SDH B3 byte, and a SDH B1 byte.

1 22. The method of claim 1, further comprising:
2 calculating a second actual value using second selected data of the data pattern;
3 determining a second desired value of the second-actual-value calculation using the
4 second selected data;
5 determining a second correction value to be applied to a portion of the second selected
6 data;
7 performing an operation using the second correction value and the portion of the
8 second selected data, thereby yielding a second replacement value; and
9 making the portion of the second selected data equal to the second replacement value,
10 thereby yielding adjusted second selected data.

1 23. The method of claim 22, wherein the step of determining the second
2 correction value comprises performing an exclusive-Or operation of the second actual value
3 and the second desired value.

1 24. The method of claim 23, wherein the step of performing the operation using
2 the second correction value comprises performing an exclusive-Or operation of the second
3 correction value and the portion of the second selected data.

1 25. The method of claim 24, wherein the selected data and the portion of the
2 second selected data are mutually exclusive.

1 26. The method of claim 1, wherein the selected data is selected from a single
2 frame of the data pattern.

1 27. The method of claim 1, further comprising calculating an adjusted actual value
2 using the adjusted selected data, wherein the adjusted actual value equals the desired value.

1 28. The method of claim 1, wherein the step of determining the correction value
2 comprises performing an exclusive-Or operation of the actual value and the desired value.

1 29. The method of claim 1, wherein the step of performing the operation
2 comprises performing an exclusive-Or operation of the correction value and the portion of the
3 selected data.

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1 30. An error-rate test system comprising:
2 a pattern generator adapted to input a finite data pattern comprising at least one frame
3 to a device under test, wherein the device under test sequentially processes and outputs data
4 of the input finite data pattern;
5 wherein a correction value comprises the result of an exclusive-Or operation of an
6 actual value and a desired value of a calculation performed on a selected portion of at least
7 one frame of the finite data pattern;
8 wherein a replacement value comprises an exclusive-Or operation of the correction
9 value and a portion of the selected portion; and
10 wherein the portion of the selected portion is made equal to the replacement value.

1 31. The system of claim 30, wherein the data pattern comprises at least one
2 Synchronous Optical Network (SONET) frame.

1 32. The system of claim 31, wherein the actual value comprises the result of a Bit
2 Interlace Parity (BIP) calculation.

1 33. The system of claim 32 wherein:
2 the data pattern comprises at least a last frame and a first frame;
3 the desired value is stored in the first frame;
4 the actual value is calculated on the last frame.

1 34. The system of claim 30, wherein the data pattern comprises a plurality of
2 frames and a plurality of the plurality of frames include identical B bytes.

1 35. The system of claim 33, wherein the last frame and the first frame are the
2 same frame.

1 36. The system of claim 30, wherein the desired value comprises at least one of a
2 SONET B2 byte, a SONET B3 byte, and a SONET B1 byte.

1 37. The system of claim 30, wherein the number of frames in the data pattern
2 equals one

1 38. The system of claim 30, wherein the data pattern comprises at least one
2 Synchronous Digital Hierarchy (SDH) frame.

1 39. The system of claim 38, wherein the actual value comprises the result of a Bit
2 Interlace Parity (BIP) calculation.

1 40. The system of claim 39, wherein:
2 the data pattern comprises at least a last frame and a first frame;
3 the desired value is stored in the first frame;
4 the actual value is calculated on the last frame.

1 41. The system of claim 38, wherein the data pattern comprises a plurality of
2 frames and a plurality of the plurality of frames include identical B bytes.

1 42. The system of claim 40, wherein the last frame and the first frame are the
2 same frame.

1 43. The system of claim 30, wherein the desired value comprises at least one of a
2 SDH B2 byte, a SDH B3 byte, and a SDH B1 byte.

1 44. The system of claim 30, wherein:
2 a second actual value is calculated using a second selected portion of the at least one
3 frame;
4 a second desired value of the second-actual-value calculation is determined using the
5 second selected portion;
6 a second correction value to be applied to a portion of the second selected portion is
7 determined;
8 an operation is performed using the second correction value and the portion of the
9 second selected portion, the operation using the second correction value and the portion of
10 the second selected portion yielding a second replacement value; and
11 the portion of the second selected data is made equal to the second replacement value,
12 thereby yielding an adjusted second selected portion.

1 45. The system of claim 44, wherein the determination of the second correction
2 value comprises performing an exclusive-Or operation of the second actual value and the
3 second desired value.

1 46. The system of claim 45, wherein the operation using the second correction
2 value and the portion of the second selected portion comprises performing an exclusive-Or
3 operation of the second correction value and the portion of the second selected portion.

1 47. The system of claim 46, wherein the selected portion and the portion of the
2 second selected portion are mutually exclusive.

1 48. The system of claim 30, wherein the selected portion is selected from a single
2 frame of the data pattern.

1 49. The system of claim 30, wherein an adjusted actual value using the adjusted
2 selected data is calculated and the adjusted actual value equals the desired value.

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